



**COURSE TITLE/SECTION:** SOCW 8325 (18672) Applied Multivariate Statistics

**TIME:** Tuesday 1:00 p.m. – 4:00 p.m., Room: 100K, Social Work Building

**FACULTY:** Patrick Leung, PhD      **OFFICE HOURS:** M 12-1 & 4:00-5:00 p.m.

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## **I. Course**

### **A. Catalog Description**

Prerequisite: SOCW 8324 Bio Statistics and doctoral standing in social work. Emphasizes the use of the Statistics Package for Social Sciences (SPSS) in applied social work research.

### **B. PURPOSE**

The purpose of this course is to prepare students to use SPSS to analyze data in a wide variety of applied research settings. This course will focus on advanced statistical procedures in association with procedures in SPSS. Multiple Regression, Analysis of Variance and Analysis of Covariance will be highlighted in the SPSS Program.

## **II. Objectives**

Upon completion of this course, students will be able to:

1. Demonstrate an understanding of the relationship between research design and the use of SPSS in applied social work research;
2. Demonstrate the use of the Statistical Package for Social Sciences to analyze multivariate statistical data in applied social work research;
3. Demonstrate an understanding of the principles of probability theory in basic multivariate statistical analyses including Multiple Regression, Analysis of Variance, Analysis of Covariance in association with the SPSS Program ; and
4. Demonstrate an understanding of the programming and commands in the SPSS Program.

### III. Course Content

This course is the second of three required statistics courses in the doctoral curriculum. A topical outline is included with the class schedule and reading assignments in a separate attachment to this syllabus.

### IV. Course Structure

The course will be taught using a combination of instructional methods including group and class discussions, lectures, exercises, assigned and recommended readings, and homework assignments. Computer technology for statistical analyses will also be included.

### V. Required Texts/Software

Abu-Bader, S. (2010). Advanced and multivariate statistical methods for social work research. Chicago, IL: Lyceum Books, Inc.

Field, A.(2013). Discovering statistics using SPSS (4<sup>th</sup> ed.). Beverly Hills, CA: Sage Publications.

Norusis, M. (1997). SPSS 7.5 guide to data analysis. Upper Saddle River, New Jersey: Prentice Hall, chapters 19-23.

SPSS, Inc. (2013). SPSS for windows graduate pack version, Version 22.0. Chicago, IL: (Author) (or the latest version).

#### Recommended Texts

American Psychological Association. (2009). Publication manual of the American Psychological Association (6th ed.). Washington, DC: Author.

Allison, Paul D. (1999). Multiple regression: A primer. Thousand Oaks, CA: Pine Forge Press.

Beck-Lewis, Michael S. (1980). Applied regression: An introduction. Beverly Hills, CA: Sage Publications.

Berry, William D. & Feldman, Stanley (1985). Multiple regression in practice. Beverly Hills, CA: Sage Publications.

Bray, James H. & Maxwell, Scott E. (1985). Multivariate analysis of variance. Beverly Hills, CA: Sage Publications.

- Green, S, & Salkind, N. (2011). Using SPSS for Windows and Macintosh: Analyzing and understanding data (6<sup>th</sup> ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- Grimm, L., & Yarnold, P. (Eds.). (1995). Reading and understanding multivariate statistics. Washington, D.C.: American Psychological Association.
- Iversen, Gudmund R. & Norpoth, Helmut (1976). Analysis of variance. Beverly Hills, CA: Sage Publications.
- Kinnear, P.R., & Gray, C.D. (1999). SPSS for windows made simple. 3rd ed. East Sussex UK: Psychology Press, Publishers.
- Tabachnick, B.G., & Fidell, L.S. (2007). Using multivariate statistics (5<sup>th</sup> ed.). Boston, MA: Allyn and Bacon.
- Wildt, Albert R. & Ahtola, Olli T. (1978). Analysis of covariance. Beverly Hills, CA: Sage Publications.

## **VI. Course Requirements**

### **A. Reading Assignments**

Please see Topical Outline and Reading Assignments.

### **B. Written Assignments**

To assist students in completing the learning objectives for this course, there will be three graded homework assignments related to the course content. Only hard copies of the assignments will be accepted.

### **C. Final Exam**

A final exam will be required of all students to demonstrate their knowledge and competency in multivariate statistical analysis.

### **D. Class Participation**

#### **1. Class Attendance (5%)**

One point will be taken from the final grade for each absence from class. However, a student who is absent from class for more than five times (including both excused and non-excused absence) will be dropped from the course. In the case that the absence is approved by the instructor, half a point will be deducted from the final grade.

#### **2. Class Participation (5%)**

Students are expected to participate in class discussions and projects.

## VII. Evaluation and Grading

Final course grades will be based on the following distribution:

Feb. 18	Homework Assignment #1 Due	20%
March 18	Homework Assignment #2 Due	20%
April 8	Homework Assignment #3 Due	20%
April 22	Final Exam	30%
	Class Participation	5%
	Class Attendance	5%

The following standard grading scale has been adopted for all courses taught in the college:

A =	96-100% of the points	C+ =	76-79.9%
A- =	92-95.9%	C =	72-75.9%
B+=	88-91.9%	C- =	68-71.9%
B =	84-87.9%	D =	64-67.9%
B- =	80-83.9%	F =	Below 64%

No "incomplete" grades will be given by any instructor without prior permission (excluding an unforeseen emergency) from the instructor.

## VIII. Policy on grades of I (Incomplete):

The grade of "I" (Incomplete) is a conditional and temporary grade given when students are either **(a)** passing a course or **(b)** still have a reasonable chance of passing in the judgment of the instructor but, for non-academic reasons beyond their control have not completed a relatively small part of all requirements.

Students are responsible for informing the instructor immediately of the reasons for not submitting an assignment on time or not taking an examination. Students must contact the instructor of the course in which they receive an "I" grade to make arrangements to complete the course requirements. Students should be instructed not to re-register for the same course in a following semester in order to complete the incomplete requirements.

The grade of "I" must be changed by fulfillment of course requirements within one year of the date awarded or it will be changed automatically to an "F" (or to a "U" [Unsatisfactory] in S/U graded courses). The instructor may require a time period of less than one year to fulfill course requirements and the grade may be changed by the instructor at any time to reflect work complete in the course. The grade of "I" may not be changed to a grade of **W**.

## **IX. Policy on academic dishonesty and plagiarism**

Students are expected to demonstrate and maintain a professional standard of writing in all courses, do one's own work, give credit for the ideas of others, and provide proper citation of source materials. Any student who plagiarizes any part of a paper or assignment or engages in any form of academic dishonesty will receive an "I" for the class with a recommendation that a grade of F be assigned, subsequent to a College hearing, in accordance with the University policy on academic dishonesty. Other actions may also be recommended and/or taken by the College to suspend or expel a student who engages in academic dishonesty.

All papers and written assignments must be fully and properly referenced using APA style format (or as approved by the instructor), with credit given to the authors whose ideas you have used. If you are using direct quotes from a specific author (or authors), you must set the quote in quotation marks or use an indented quotation form. For all direct quotes, you must include the page number(s) in your text or references. Any time that you use more than four or five consecutive words taken from another author, you must clearly indicate that this is a direct quotation. Please consult the current APA manual for further information.

Academic dishonesty includes using any other person's work and representing it as your own. This includes (but is not limited to) using graded papers from students who have previously taken this course as the basis for your work. It also includes, but is not limited to submitting the same paper to more than one class. If you have any specific questions about plagiarism or academic dishonesty, please raise these questions in class or make an appointment to see the instructor. This statement is consistent with the University Policy on Academic Dishonesty that can be found in your UH Student Handbook.

## **X. Consultation**

Individual appointments will be scheduled with any member of the class upon request. The instructor can be reached by calling (713) 743-8111 or contacting him in his office during office hours (Work Building Room 412), or by e-mail at PLEUNG@UH.EDU or by fax at (713) 743-8149.

**Addendum:** Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.

## TOPICAL OUTLINE AND READING ASSIGNMENTS

<u>Class Session</u>	<u>Lecture Topic and Readings</u>
January 14	Introduction Review of Course Syllabus A Framework for Statistical Analysis Review of Univariate and Bivariate Statistics  Abu-Bader Chs. 1 & 2 Field Chs. 1, 2, 3, 4, 6, 7 and 9
January 21	Review of Simple Linear Regression  Abu-Bader Ch. 3
January 28	Issues in Statistical Assumptions  Field Ch. 5
February 4 to February 11	Multiple Regression Analysis I The Regression Assumptions Confidence Intervals and significance test The Prediction Error for Y Analysis of Residuals  Abu-Bader Ch. 4 Field, Ch. 8
<b><u>February 18</u></b>	<b><u>Homework Assignment #1 Due</u></b>
February 18	Multiple Regression Analysis II The General Equation Interpreting the Parameter Estimates The Multiple R-square Predicting Y The Possibility of Interaction Effects Dummy Variables  Norusis, Chs. 19-23 (to be placed outside my office door)
February 25	Multiple Regression Analysis III Specification Error Measurement Error Multicollinearity & Nonlinearity

Moderation & Mediation

Field, Ch. 10

March 4 One-Way ANOVA  
Two-Way ANOVA  
Abu-Bader Chs. 1 and 6  
Field, Chs. 11 (ANOVA) & 13 (Factorial ANOVA)

March 11 Spring Break (No Class)

**March 18** **Homework Assignment #2 Due**

March 18 Two-Way ANOVA  
to Two-way Analysis of Covariance  
March 25  
  
Abu-Bader Chs. 7  
Field, Chs.14 (ANCOVA)

**April 8** **Homework Assignment #3 Due**

April 1 to MANOVA & MANCOVA  
April 15  
  
Abu-Bader Ch. 9  
Field, Ch.16

**April 22** **Final Exam**

## BIBLIOGRAPHY

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Elliott, A. C., & Woodward, W. A. (2007). *Statistical analysis quick reference guidebook: With SPSS examples*. Thousand Oaks, Calif: Sage Publications. \*(HA29 .E4826 2007)

Foster, J. J., Barkus, E., & Yavorsky, C. (2006). *Understanding and using advanced statistics*. London: SAGE Publications. \*(HA29 .F583 2006)

Frankfort-Nachmias, C. & Leon-Guerrero, A. (2006). *Social Statistics for a diverse society* (4th ed.). Thousand Oaks: Pine Forge Press

Gaur, A. S., & Gaur, S. S. (2006). *Statistical methods for practice and research: A guide to data analysis using SPSS*. New Delhi: Response Books. \*(HA32 .G38 2006)

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Healey, J.F. (1984). *Statistics: A tool for social research*. Belmont, CA: Wadsworth.

Hancock, G. R., & Mueller, R. O. (2010). *The reviewer's guide to quantitative methods in the social sciences*. New York: Routledge. \*(H62 .R466 2010)

Hopkins, D.K., Hopkins, B.R., & Glass, G.V. (1996). *Basic statistics for the behavioral sciences*. Boston : Allyn and Bacon. \*(HA29 .H734 1996)

Huizingh, E. (2007). *Applied statistics with SPSS*. London: SAGE. \*(QA276.4 .H82 2007)

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- Petscher, Y. M., Schatschneider, C., Compton, D. L., & Petscher, Y. M. (2013). *Applied quantitative analysis in education and the social sciences*. \*(QA278.2 .A67 2013)
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- Zeller, R.A., & Carmines, E.G. (1978). *Statistical analysis of social data*. Chicago: Rand McNally.

### **Multivariate Analysis: General**

- Atkinson, A. C., Riane, M., & Ceriole, A. (2004). *Exploring multivariate data with the forward search*. New York: Springer-Verlag . \*(QA278.A85 2004)  
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### **Multiple Correlation/Regression**

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